

January 2000

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Recommended Citation

Scher, Steven J. and Ferrari, Joseph R., "The Recall of Completed and Noncompleted Tasks Through Daily Logs to Measure Procrastination" (2000). *Faculty Research and Creative Activity*. 27.

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The Recall of Completed and Noncompleted Tasks Through Daily Logs to Measure Procrastination

Steven J. Scher and Joseph R. Ferrari

Abstract: For five consecutive days, participants listed daily tasks they intended to complete. Recall of listed tasks served as the primary dependent variable. Characteristics of the task, including whether or not the task was actually completed, did not, in general, predict recall. The one exception was that the rated importance of the task to one's family did increase the likelihood of recall. Individual differences in avoidant procrastination were negatively related to the likelihood of recalling listed tasks. Avoidant procrastination also was related (positively) to false positive rates, the degree to which individuals "recalled" tasks that they had not listed the previous day. These findings suggest that procrastinators may have general cognitive processing strategies that are different from non-procrastinators. However, further research is needed to explore the information processing abilities of people who delay completing tasks.

Individuals who frequently exhibit a lifestyle pattern of delaying task completions or the start of tasks have been labeled chronic procrastinators (Burka & Yuen, 1983). Procrastination has been reported to be pervasive within everyday settings (Ellis & Knaus, 1977) and among normal (non-clinical) adult populations (Harriott & Ferrari, 1996). Correlational studies report that procrastination has been related to low self-esteem, self-confidence, self-control, conscientiousness, and high states of perfectionism, non-competitiveness, self-deception, dysfunctional impulsivity, depression, and anxiety (Ferrari, 1991a, 1993, 1994; Ferrari & Emmons, 1995; Flett, Blankstein, & Martin, 1995; Flett, Hewitt, & Martin, 1995; Lay, 1988, 1995; Lay, Edwards, Parker, & Endler, 1989). Experimental studies reveal that procrastinators often self-handicap their task performance (Ferrari, 1991b), and even recommend severe reprimands for poor performance observed in other procrastinators (Ferrari, 1992a). Thus, it seems that procrastination is associated with a maladaptive lifestyle with serious personal and social consequences.

Several studies have explored the daily tasks that are delayed by procrastinators. People report delaying the completion of aversive, difficult, and unpleasant tasks (Scher & Ferrari, 1998). They avoid activities that would reveal information concerning their true abilities (Ferrari, 1991d) and prefer to work on easy, unchallenging tasks (Ferrari, 1991c). Procrastinators make poor estimates about the amount of time needed to complete activities (Lay, 1988), do not act on their intentions to perform a task (Lay & Burns, 1991), and prefer to engage in pleasurable activities in the morning, saving unpleasant tasks until the evening (Ferrari, Harriott, Evans, Lecik-Michna, & Wenger, 1997).

A growing body of literature has focused on cognitive aspects of procrastination (see Burnett, 1991; Burnett, Mann, & Beswick, 1989; Effert & Ferrari, 1989; Janis &

Mann, 1977). Previous research indicated that procrastinators use ineffective decision making strategies (Berzonsky & Ferrari, 1996), and that procrastinators may be unable to focus their cognitive abilities on completing a task because they are easily distracted and tend to daydream (Harriott, Ferrari, & Dovidio, 1996). Procrastinators also avoid self-relevant diagnostic information (Ferrari, 1991c).

Despite the interest in the cognitive factors associated with procrastination, it is not known whether people recall procrastinated and non-procrastinated tasks differently. Nonetheless, it seems possible that one thing that may lead to the noncompletion of intended tasks is a failure to remember the task. Therefore, the present study was designed as an exploratory investigation into the degree to which procrastinators recall the tasks they intended to complete. The number of participants in this study was small; however, the focus was on the tasks recalled or not recalled — not on participants per se. Over 750 tasks were identified by participants across five days of daily logs.

METHOD

Participants

Forty undergraduates from a medium-sized, private, urban, Midwestern university were recruited to participate in the study. Twenty-five persons participated during the second week and fifteen persons participated in the second to last week of two academic terms. Three of the students dropped out before the completion of the study; therefore, only 37 participants provided complete data for the task-level analysis. Participants in the early part of the term were paid \$35 for their participation, while participants in the later part of the term were paid \$50 to complete the study.

Overview

On five consecutive days, participants reported on tasks that they intended to complete within the coming 24 hours, and indicated which of the tasks reported the previous day they had actually completed. Both completed and non-completed tasks were rated on 17 dimensions. Three individual difference scales on procrastination were also completed. Participants also completed other self-report inventories; however, those measures are not reported here since the present study focused on procrastination tendencies (see Scher & Ferrari, 1998, for details).

Psychometric Measures

Participants completed a measure of decisional procrastination and two general procrastination scales. Mann's (1982) 5-item Decisional Procrastination Scale (DP), a reliable and valid measure of a cognitive form of procrastination (i.e., indecision) was completed. Inventory items include "I delay making decisions until it is too late"

or "I put off making decisions." The scale had a Cronbach alpha of .84 with the present sample.

Participants also completed McCown and Johnson's (1989) 15-item Adult Inventory of Procrastination (AIP), a behavioral index of frequent task delays across a number of situations (e.g., "I pay bills on time": reverse scored). Coefficient alpha in the present sample was 0.83. In addition, participants completed Lay's (1986) 20-item General Procrastination Scale (GP), assessing everyday forms of task delays such as "I generally return phone calls promptly" and "I don't R.S.V.P. invitations on time." With the present sample coefficient alpha was 0.90. Details (including a complete list of items and reviews of reliability and validity research) on these and other procrastination scales are summarized in Ferrari, Johnson, and McCown (1995). In the present study, all items were rated on 5-point scales (1 = not true for me; 2 = often untrue of me; 3 = sometimes true/false for me; 4 = often true for me; 5 = true for me). Correlates among these scales in the current study were reported in Scher and Ferrari (1998).

Procedure

Participants were required to report to the laboratory for five consecutive days. On Day 1, after completing informed consent forms and other associated administrative details, participants completed the individual difference measures on procrastination. Following the completion of these measures, participants were instructed to complete one Future Intended Activity Report (FIAR) for each task that they intended to do within the next 24 hours.

The FIARs asked participants to provide a task name and a description of the task, and to indicate how important it was that they accomplish "the part of this task you intended to complete within the next 24 hours." Responses were made on a 27-point Likert-type scale, with the endpoints labeled (i.e., not at all important and very important). Participants also were asked to indicate the percentage of the task they intended to complete within the next 24 hours. These responses were made by circling a percentage, with choices ranging from 5% to 100%, in increments of 5%.

On each of the next three days (Days 2 to 4), participants reported to the lab at the same time and were asked to list all those activities that they had reported on the previous day. These data were subsequently compared to the actual list of tasks they had provided on the previous day. Following this recall task, participants were provided with a series of Past Intended Activity Reports (PIARs) filled out with each of the tasks that they had reported on FIARs the day before. These forms listed the task name they had given on the previous day's FIAR, and asked participants to indicate how much time they actually spent on the task (on an 11-point scale, with endpoints labeled "no time at all" and "very much time"). They also indicated what percentage of what they intended to accomplish they actually did accomplish. Responses to this latter question were made by circling a percentage, with choices

beginning at 0%, and increasing in increments of 5% up to 100%. An option of "> 100%" was also included.

Participants were next given rating forms filled in with each of the tasks that they had reported on the previous day's FIARs. Participants rated each task on the degree to which it is anxiety-provoking, pleasurable, stimulating, provided an opportunity to show skill, creates self-confidence, requires effort, requires thought, is difficult, takes a long time to finish, is relaxing, is creative, is an active task, is important to me, is an important task in the eyes of my close friends, and is an important task in the eyes of my family. Each rating was made on a scale ranging from 1 ("does not apply at all") to 6 ("applies very much"). Finally, participants completed FIARs for the tasks they intended to complete within the next 24 hours. On Day 5, participants completed the free recall task, the PIARs, and the rating of their intended tasks from the previous day. All participants were then thanked, paid, and provided with a brief description of the purpose of the study.

RESULTS

The focus of the current study was to identify what factors were associated with whether or not participants remembered tasks they had reported as intending to complete the previous day. An analysis of factors related to what tasks people do or do not complete appears in Scher and Ferrari (1998).

The simplest analysis of these memory data is to look at the relationship between whether or not participants reported having completed a task, and whether or not they remembered having listed that task on the previous day. Tasks were coded as "completed" if participants said they completed at least 80% of what they had intended to complete. Participants remembered having mentioned 385 (86.9%) of the 433 tasks that they indicated they had completed. Participants reported 321 tasks where they said they did not complete at least 80% of what they intended; they remembered having listed 282 (87.9%) of these tasks. Not surprisingly, given the similarity of these percentages, a chi-square analysis is not significant ($\chi^2 (1) = .15, p < .50$), suggesting that there is no evidence of a relationship between completion status and memory for a task.

Factor Analysis

To examine the structure of task ratings, an exploratory factor analysis on the task rating dimensions was conducted. The factor analysis used "task" as the unit of analysis ($n = 754$ tasks). A three factor solution replicated in the data from both early and later testing sessions. These three factors could be labeled Effort and Anxiety (task is difficult, requires effort, requires thought, takes a long time, anxiety-provoking, percentage of task intended to complete), Skill and Self-Confidence (task requires skill, creates self-confidence, is creative, active, important in general, and important to me), and Pleasure and Relaxation (task is pleasurable, relaxing, and stimulating). The "importance to friends" and "importance to family" variables did

TABLE 1 Zero-order Correlates between Task Level, Individual Difference Variables, Likelihood of Task Recall, and False Positive Rate

	<i>Likelihood of Task Recall</i>	<i>False Positive Rate</i>
GP	-.08*	.12
AIP	-.15**	.40**
DP	-.01	-.09
"Effort/Anxiety" Factor	.04	—
"Skill/Confidence" Factor	.01	—
"Pleasure/Relaxing" Factor	-.03	—
Importance to Family	.09*	—
Importance to Friends	-.02	—
Term Session	-.09	—
Completion Status	-.01	—

* = $p < .05$; **; $p < .01$.

Note: GP = General Procrastination; AIP = Adult Inventory of Procrastination; DP = Decisional Procrastination; Memory code, 0 = task not remembered, 1 = task remembered; Term Session, 1 = Late Session, 2 = Early Session

not reliably load on any of these factors. Details of the factor analysis of tasks may be found in Scher and Ferrari (1998). For the current analysis, however, factor scores were created by summing the relevant variables for each factor and these factor scores were included in all subsequent analyses.

Table 1 reports the zero-order correlation coefficients between memory for the task, each of the three procrastination scores, the tasklevel variables or factors, and the session in which participants participated. Only General Procrastination scores and Adult Inventory of Procrastination scores, and importance to family ratings were significantly related to memory recall. None of the coefficients are very large.

Predicting Memory

In the next stage of the analysis, we used logistic regression to examine how the individual difference and task-level variables combined to predict memory tasks. The likelihood of remembering a task was estimated with each of the procrastination scales (DP, AIP, GP), the three factor scores, the importance to friends and importance to family variables, the completion status of the task, and the session that participants were in (i.e., whether they participated early in the academic term or late in the academic term) as predictors.

TABLE 2 Results of Logistic Regression of Memory Data

<i>Predictor</i>	<i>Standardized Parameter Est.</i>	<i>Standard Error</i>	<i>WALD χ^2</i>	<i>Odds Ratio</i>
AIP	-.21	.01	13.06	.97
Session	-.16	.23	6.99	.55
Importance to Family	.17	.06	6.73	1.17

Note: "AIP" = Adult Inventory of Procrastination"; "Parameter Est." = Parameter estimate; All estimates have one degree of freedom, and all χ^2 have probabilities less than .001.

An iterative procedure was used where an equation with only an intercept was first estimated, and then adjusted chi-square values were examined. The predictor with the largest adjusted chi-square was entered into the model, provided the chi-square value had a probability level less than .10. This process was repeated until no predictors remained outside the model whose adjusted chi-square was less than .10. However, at each iteration, the predictors in the current model were also examined, and the least significant predictor which did not meet the $p < .10$ probability level was removed from the model.

The Hosmer-Lemeshow goodness of fit test suggests that the final model fit the data well, $\chi^2 (8) = 5.70$, $p = .68$. As can be seen in Table 2, AIP scores were the only procrastination index that remained in the model. Participants higher in procrastination as measured by the AIP were less likely to remember tasks listed as completed. Furthermore, only two other variables were related to memory for tasks. Which session participants attended was a significant predictor of whether or not people remembered tasks: participants in the early session remembered a total of 83.6% of the tasks they listed the previous day, while participants in the later session remembered 89.5% of the tasks they listed. The importance of tasks to members of the family also predicted whether or not the tasks were remembered, such that the more important the task was in the eyes of one's family, the more likely participants were to remember the task.¹

False Positives

The degree to which participants recalled "false positives," tasks they listed on their recall sheets that they had not listed the previous day, also was examined. On the whole, people did not have many false positives. The mean number of total false positives listed in the recall task was only 1.32 (SD = 1.79). The zero-order correlation between the number of false positives listed over the four days of the data collection and the various procrastination scales are listed in Table 1. Only the correlation between the AIP and false positive rates was significant.

DISCUSSION

In a number of ways, the results from this brief, exploratory study provide an interesting picture into how people recall everyday tasks. First, both zero-order correlates and regression analyses indicated that self-identified procrastinators may recall fewer completed tasks than non-procrastinators.

Difference in recall memory may be related to type of procrastination. Previous research indicated that the GP and AIP scales may assess different forms of procrastination (Ferrari, 1992b). Ferrari (1992b) found that GP scores seem to be related to "arousal procrastination" where people delay tasks for a thrill-seeking experience, and AIP scores related to "avoidance procrastination" such that people delay task completion because they believe their performance may reflect some true ability.

In the present study, high AIP scores (but not GP or DP scores) reflected low recall of the previous day's listed tasks. Furthermore, only high AIP scores were related to a tendency to list more tasks from the previous day which were not among the true list of those tasks (i.e., false positives). It is possible that avoidant procrastinators may be persons who suppress the recall of the previous day's tasks as a way to cope with their frequent tendency to delay tasks. It may be more adaptive for chronic avoidant procrastinators to simply "forget" what they were planning to do and then to list more than they said they were going to do. Alternatively, rather than suppress recalling tasks, it is possible that avoidant procrastinators simply avoid: They don't think about tasks they need to do. Because completing the task may reflect their performance level, which they believe indicates their self-worth, it is possible that avoidant procrastinators just do not think much about all the tasks they have to do and this in turn impacts on their recall of previous tasks. Arousal procrastinators, and indecisives, may not be motivated either before or after recalling a task by a desire to protect their self-schema from verification of potential poor ability to the level that avoidant procrastinators are motivated. Clearly, further research is needed in this area.

Second, it seems that regardless of a person's self-reported procrastination tendency, people recall more tasks to be completed later than earlier in an academic term. The present study examines everyday procrastination, but the participants were undergraduates and testing occurred within the start and near completion of academic terms. It is quite possible that these students were more aware of all the tasks that they failed to complete earlier in the term and now need completion toward the end of the term. The authors, in fact, are conducting additional research into the nature of academic and nonacademic task completion or delays by individuals.

Third, the present study indicated that the recall of tasks completed or delayed was related to their importance to one's family. This outcome was unexpected, but

consistent with other research on family relations and chronic procrastination (see Ferrari & Olivette, 1993, 1994; Ferrari, Harriott, & Zimmerman, 1999). Taken together, these other studies indicate that chronic procrastinators have dysfunctional family settings with much conflict and stress between parents and children. Perhaps, participants in the present study were unable to recall tasks that were delayed as a way to avoid thinking about the domestic conflicts associated with those tasks. Of course, any interpretation of those results are speculative. Future research into the cognitive skills and information processing abilities of various forms of chronic procrastination seems warranted. The present study was an initial exploration into the recall memory that people engage in their retrieval of everyday tasks.

Authors' Notes: Funding for this project was made possible through a DePaul University "Competitive Research Grant" awarded to the second author. The sequence of authors was determined by a flip of a coin; both contributed equally to this paper.

1 Including all of the individual difference measures participants completed in this study, as reported in Scher and Ferrari (1998), into the iterative regression made little difference to the present results. The final model included all of the predictors included in the current results. In addition, manifest anxiety (as measured by the short-form of the Taylor Manifest Anxiety Scale; Bendig, 1956) had a positive relationship with likelihood of memory. Also, negative affect (measured by the Positive and Negative Affect Scales: Watson, Clark, & Tellegen, 1988) was negatively related to memory of tasks. However, this model did not fit the data well, Hosmer-Lemeshow, $\chi^2 (8) = 16.53$, $p < .05$.

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